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### REMARKS

Claims 1-11, 14, 17-21, 23-25, 28, 30-35, 44, 45, and 69-84 are pending in the application. Claims 12-13, 15-16, 22, 26-27, 29, 36-43 and 46-68 were previously or are currently cancelled. Claims 1-6, 9-11, 14, 17-21, 23, 25, 28, 44-45, 70 and 75-81 are currently amended.

Applicants appreciate Examiner's withdrawal of certain rejections and appreciate Examiner's suggestion for amending some of the claims. Upon careful review of the instant Office Action, Applicants also note that no prior art rejections apply. Accordingly, the claims, as amended, recite novel and patentable subject matter.

### Sequence Compliance

In the response filed on September 6, 2005, Applicants resubmitted a paper copy of the sequence listing along with a computer-readable disk with all sequences for the instant application along with a statement that the computer-readable format is the same as the paper format. Examiner has indicated that it was not clear why the sequences were filed.

Applicants re-filed the sequences because there appeared to be confusion as to whether the sequences disclosed in the two co-pending applications 09/917,383 and 09/917,384 are identical. Applicant would like to refer Examiner to page 2 of the Notice of Allowability issued by Examiner Patterson on August 26, 2005 for application 09/917,383, where Examiner Patterson noted that "apparently the CRF is incorrect in 09/917,384." Examiner Patterson also noted that "the written sequence disclosure" in 09/917,383 and 09/917,384 "show that SEQ ID NO: 1, 2, 4, 5 and 7 are different in each application." Based on these statements, Applicants suspect that mistakes may have been made in the submission or entry of the sequences disclosed in the instant application. That is the reason why Applicants re-submitted both the paper and computer-readable copies of the sequences. Both copies of the re-submitted sequence are identical to the paper copy of sequences previously submitted on 11/27/02.

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### **Claim Objection**

Claim 78 has been objected to for informality. Applicants fail to understand the basis of this objection and respectfully request more guidance from Examiner. Examiner also states that Claim 11 improperly recites SEQ ID NO: 2 as an amino acid sequence. However, the language of Claim 11 recites a peptide being encoded by a polynucleotide sequence of SEQ ID NO: 2. Applicants fail to understand why such language would indicate that SEQ ID NO: 2 is an amino acid sequence. Withdrawal of the objection is respectfully requested.

### **Claim Rejections - 35 U.S.C. §112 Second Paragraph**

#### **I. Claims 1, 6 and Claims 2-5, 7-11, 14-21, 23-25, 44-45, 69-78**

Claims 1, 6 and Claims 2-5, 7-11, 14-21, 23-25, 44-45, 69-78 stand rejected for being indefinite for failure to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants note that Claims 10-11, 44-45 and 75-77 do not depend from either Claim 1 or Claim 6. Withdrawal of rejections of these claims is respectfully requested.

In rejecting the above-mentioned claims, Examiner maintained that the phrase "comprising a glycoside hydrolase 48 (GH48) family catalytic domain" renders independent Claims 1 and 6 indefinite. Applicants respectfully traverse Examiner's position because both Claims 1 and 6 are directed to compositions containing certain protein ingredients, with the structure of such protein ingredients being defined by their domain structures. Protein activity is not an express limitation of these claims, and the metes and bounds of the claims are well defined by the recitation of the domains. Even if protein activities are to be considered as a claim limitation, Claims 1 and 6 recite a peptide containing a catalytic domain that belongs to the GH48 family. The plain language of the phrase referred to above does not read on all activities of a glycoside hydrolase; rather, the plain meaning of the phrase appears to be limited to the catalytic activity of a GH48 domain.

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Claims 1 has been amended to further define that the peptide contains a GH48 catalytic domain with about 90% percent sequence identity with SEQ ID NO. 5, and Claim 6 has also been amended to recite SEQ ID NO. 5. The specification is replete with teachings that the catalytic domains of the GH48 family enzymes share some sequence similarity (See pages 17-18 and 32-33 of the instant application). Thus, Claims 1 and 6, and their dependent claims, as amended, have pointed out the subject matter which Applicants regard as their invention. Withdrawal of the rejection of Claims 1, 6 and Claims 2-5, 7-11, 14-21, 23-25, 44-45, 69-78 is respectfully requested.

## **II. Claims 75-78**

Claims 75, 76 and 78 stand rejected as being indefinite. Claims 75 and 78 have been amended according to Examiner's suggestion to overcome this rejection.

Claims 76 and 77 are rejected as being indefinite because they contain the phrase "further defined as the sequence of ...." Claims 76 and 77 have been amended according to Examiner's suggestion to overcome this rejection.

## **III. Claims 81, 82 and 84**

Claims 81, 82 and 84 are rejected for lack of antecedent basis in Claim 81. Claim 81 has now been amended to overcome this rejection.

### **Claim Rejections – 35 U.S.C. §112 First Paragraph—"New matter"**

Claims 17-20, 79-84 are rejected under 35 U.S.C. §112 First Paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the claimed invention at the time the application was filed. Examiner stated that the specification as originally filed "indicated support for only '90% identity' language and that too for only SEQ ID NO: 1." (See page 5 of the Office Action). Applicants respectfully traverse Examiner's position because the added 95% or 98% sequence identity is fully supported by the application as originally filed.

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In order to satisfy the written description requirement of 35 U.S.C. §112 First Paragraph, "each claim limitation must be expressly, implicitly, or inherently supported in the originally filed disclosure." See MPEP 2163. *In re Wertheim*, the ranges described in the original specification included a range of "25%-60%" and specific examples of "36%" and "50%." 541 F.2d 257, 191 USPQ 90 (CCPA 1976). The court ruled that a corresponding new claim limitation to "at least 35%" did not meet the description requirement because the phrase "at least" had no upper limit and caused the claim to read literally on embodiments outside the "25% to 60%" range. *Id.* A limitation to "between 35% and 60%," however, did meet the description requirement. *Id.*

The original specification as filed teaches that Gux1 polypeptides of the invention are preferably at least 60%, 70%, or 90% in some embodiments, identical to SEQ ID NO: 1 (See lines 39-41 of page 18 of the specification). The specification also teaches that "Gux1 polypeptides of the invention include isolated polypeptides having an amino acid sequence as shown below in Example 1; Table 1 and in SEQ ID NO: 1, as well as variants and derivatives, including fragments, having substantial identity to the amino acid sequence of SEQ ID NO: 1 and that retain any of the functional activities of Gux1." (Lines 25-28 of page 17 of the specification). Further, "Gux1 polypeptide fragments may include, but are not limited to, the polypeptide sequences listed in Table 4, SEQ ID NOS: 3, 4, 5, 6, and 7." (Lines 9-10 of page 19).

Taken together, the instant specification teaches polypeptides that are at least 60% identical to SEQ ID NOS: 1, 3, 4, 5, 6, and 7. Apparently, polypeptides that are 100% identical to SEQ ID NOS: 1, 3, 4, 5, 6, and 7 have been disclosed in the specification, because SEQ ID NOS: 1, 3, 4, 5, 6, and 7 are 100% identical to themselves. Therefore, one of skill in the art would recognize that Applicants had possession of polypeptides that have between 60% to 100% sequence identity with SEQ ID NOS: 1, 3, 4, 5, 6, and 7 at the time the application was filed. Both 95% and 98% fall between the range of 60% to 100%. Withdrawal of the rejection of Claims 17-20, 79-84 under 35 U.S.C. §112 First Paragraph is respectfully requested.

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**Claim Rejections - 35 U.S.C. §112 First Paragraph—Enablement**

Claims 1-5, 14-16, 20-21, 28-35, 44-45, 70-74 and 79-84 are rejected under 35 U.S.C. §112 First Paragraph for lack of enablement. Examiner has acknowledged that the instant specification is enabling for a Gux 1 polypeptide comprising the GH48 catalytic domain and carbohydrate binding domains II and III having 98% sequence identity with the respective domain sequences disclosed in the specification. Examiner has also stated that the instant specification is enabling for a polypeptide having SEQ ID NO: 1 or an amino acid sequence that is 98% identical to SEQ ID NO: 1 having the catalytic activity of an exoglucanase.

Applicants observe that Claims 6-11 were not rejected for nonenablement. Applicants have now amended all claims such that all claims now recite a polypeptide or a protein having catalytic activity of an exoglucanase and containing at least one of the three domains selected from GH48 catalytic domain and carbohydrate binding domains II and III, or their variants thereof with about 95% sequence identity to the specific sequence disclosed in the specification.

Applicants have also changed the sequence identity from 98% to 95% in some instances. Examiner referred Applicants to Examples 13 and 14 of the Guidelines for Written Description. Applicants have carefully reviewed those Examples and have come to the conclusion that a 95% identity at the amino acid sequence level would satisfy both the written description and enablement requirements of 35 U.S.C. §112 First Paragraph. Applicants believe that these amendments should render the scope of the claims commensurate with the invention enabled by the specification and respectfully request withdrawal of the rejections of Claims 1-5, 14-16, 20-21, 28-35, 44-45, 70-74 and 79-84 under 35 U.S.C. §112 First Paragraph for lack of enablement.

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**Claim Rejections - 35 U.S.C. §112 First Paragraph—Written Description**

**I. Claims 1-9, 14-21, 23-25 and 69-74**

Claims 1-9, 14-21, 23-25 and 69-74 are rejected under 35 U.S.C. §112 First Paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the claimed invention at the time the application was filed.

Applicants have carefully reviewed Examiner's reasoning for rejection and have amended Claims 1-9, 14-21, 23-25 and 69-74 or the claims from which they depend, such that all claims now recite a polypeptide or a protein having catalytic activity of an exoglucanase and containing at least one of the three domains selected from GH48 catalytic domain and carbohydrate binding domains II and III, or their variants thereof with about 95% sequence identity to the specific sequence disclosed in the specification. For example, Claim 75, as amended, recites a protein with exoglucanase catalytic activity and containing domains having SEQ IDs NO. 5, 4 and 7 or their variants that are about 95% identical thereto.

This amended Claim 75 contains two generic embodiments, the first being a protein comprising SEQ IDs NO. 5, 4 and 7, and the second embodiment being variants of SEQ IDs NO. 5, 4 and 7. The instant specification teaches that not all amino acid residues can be substituted with any other amino acids and that some are preferred over others. (*See, e.g.*, lines 10-24 on page 19 and Table 3 on page 34 of the instant application, teaching strategy for amino acid substitution to preserve protein activity and showing conserved residues among homologous enzymes from different organisms). The instant application also teaches assays to measure the enzymatic activity of the protein and variants (*See* lines 17-24 on page 27).

The genus of proteins that are claimed does not have substantial variation because all of the variants must possess the specified catalytic activity of an exoglucanase and must have about 95% identity to the reference sequences. Thus, even though SEQ ID. NO 1 is the only species explicitly shown in the instant application, SEQ ID. NO 1 is

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representative of the genus because all members of the genus are structurally related to SEQ ID. NO 1 by way of domain structure and sequence similarity and because of the disclosed assay which may be utilized for identifying all of the variants that possess the exoglucanase catalytic activity. Therefore, one of ordinary skill in the art would conclude that Applicants were in possession of the necessary common attributes characteristic of the members of the claimed genus.

## **II. Claims 28-35, 44-45, 70-74 and 79-84**

Claims 28-35, 44-45, 70-74 and 79-84 are rejected under 35 U.S.C. §112 First Paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor had possession of the claimed invention at the time the application was filed. Examiner stated that these claims are rejected because they are directed to a genus of polypeptides whose function has not been described.

Claims 28-35, 44-45, 70-74 and 79-84, or the claims from which they depend, have been amended such that all claims now recite a polypeptide or a protein having catalytic activity of an exoglucanase. As explained in subsection I under the same heading, the genus of proteins that are claimed does not have substantial variation because all of the variants must possess the specified catalytic activity of an exoglucanase. This, along with the additional limitation of sequence similarity, defines the invention in such a way that one skilled in the art would reasonably conclude that Applicants had possession of the claimed invention at the time the application was filed. Withdrawal of the rejection of Claims 28-35, 44-45, 70-74 and 79-84 under 35 U.S.C. §112 First Paragraph is respectfully requested.

### **Double Patenting**

Claims 28-35 and 44-45 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 20, 27, 43, 48-54, 63, 65-67 of U.S. Patent Application 09/917,383 and claims 26, 27-34, 43-44 and 63 of

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U.S. Patent Application 09/917,378. Claims 28, 30-35, 44, 45 have been amended to recite the specific activity of the claimed compositions or proteins. Claim 29 has been cancelled.

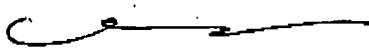
Applicants believe that the added limitation of 95% identity serves to distinguish the claimed polypeptides from those disclosed in either the '383 or '378 applications. However, should such amendments fail to overcome the double patenting rejection, Applicants have enclosed a Terminal Disclaimer, which by established law suffices to overcome such a rejection. Withdrawal of the double patenting rejection is respectfully requested.

### Conclusion

Applicants have amended the claims to overcome various section 112 rejections raised by Examiner. Applicants believe that these amended claims are in a form for allowance. Therefore, Applicant's attorney respectfully solicits a Notice of Allowance in this application. The Commissioner is authorized to charge any additionally required fees to deposit account 12-0600. Should the Examiner have any questions, comments, or suggestions that would expedite the prosecution of the present case to allowance, Applicants' undersigned representative earnestly requests a telephone call at (303) 384-7575.

Respectfully Submitted,

Date: 4/18/2006

  
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